

Abrading DeviceTechnical field

5 The present invention concerns a device for abrading walls of stone or concrete material.

Technical background

10 It is known that abrading stone and concrete floors gives many advantages including an improvement in the aesthetic impression and in addition an abraded floor is easier to clean and has less tendency to attract dirt than an unabraded floor.

A device for abrading floors is already known for example from WO 02/062524 A1.

15 The removal of graffiti from subway walls etc. is a major problem which can cause society high costs which may be considered unnecessary. The solution to this problem is to be able to abrade such walls.

A known solution for abrading stone and concrete walls is shown in US 2,787,096.

20 Summary of the invention

The object of the present invention is to produce a device suitable for abrading stone and concrete walls.

25 The invention is defined by the enclosed independent patent claim. Embodiments arise from the dependent claims and from the following descriptions and drawings.

30 Thus a device is created for abrading a wall of stone or concrete material, which device comprises a shell with which an abrading head is operationally connected, and a carriage intended for movement at least along the surface and to support the shell movably so that the abrading head by movement of the shell can perform an upward and downward abrading movement. The device is distinguished by an abrading head of the type which has a rotatably mounted and driven planet wheel with a number of driven abrading discs mounted rotatably thereon and carrying abrading elements, and

an element for placing the abrading head with a predetermined force against the surface to be abraded.

Brief description of the drawings

5 The invention will be described in more detail below with reference to the enclosed drawings.

Fig. 1 shows in perspective a preferred embodiment of a device according to the invention.

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Figs. 2a - 2b show diagrammatically in perspective the device according to the invention mounted on a forklift truck and ready for abrading a wall surface.

Description of embodiments

15 In fig. 1, numeral 1 generally indicates an abrading head which is operationally connected with a shell generally indicated by 2. The abrading head 1 is of the type which has a rotatably mounted and driven planet wheel 1a with a number of driven abrading discs 1b mounted rotatably thereon. The planet wheel 1a and the abrading discs 1b which are fitted with abrading elements not shown in fig. 1 are driven by  
20 means of a motor 3 which is mechanically coupled to the planet wheel 1a and the abrading discs 1b, for example as described in the above WO publication. As will be explained in connection with fig. 2, the shell 2 is intended to be supported on a carriage e.g. a forklift truck so that the abrading head can be moved over a wall surface to be abraded in a predetermined manner.

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The operative connection between the abrading head 1 and the shell 2 is such that the abrading head and hence the abrading elements can be placed against the surface with a predetermined force which is required for a good abrasion result and effective abrasion. For this purpose the said operational connection has a universal mounting  
30 for the abrading head 1 in the shell 2, i.e. the abrading head 1 automatically lies flat against the surface to be abraded. The universal mounting is of the conventional type; 4 indicates a frame in the universal mounting. To compensate for the weight of the abrading head 1 a counterweight 5 is provided to balance the abrading head 1.

To achieve the correct contact force against the surface to be abraded, the operational connection between the abrading head 1 and the shell 2 comprises an element provided to achieve said contact force. There are many alternative possibilities for implementing such an element; one possibility is to utilise a hydraulic cylinder/piston device, the hydraulic pressure of which is controlled so that the desired contact force is achieved. Another possibility is illustrated in fig. 1; here gas springs 6 are used to achieve the contact force. Such gas springs naturally do not have the ability to absorb lateral forces i.e. forces with a component transverse to the direction of the contact force. Elements to absorb the lateral force are the pipe 7a connected with the shell 2 and rods 7b telescoping in said tube and connected with the abrading head 1.

An essential condition for the above is naturally that the shell 2 is held fixed in the direction of the contact force. This is achieved with a carriage supporting the shell 2 e.g. a forklift truck 8, whereby the shell 2 is supported by the forks 8a of the truck 8. 15 This achieves the advantage that the abrasion can be performed during the lifting and lowering of the forks, where in between the truck moves so that a surface area not previously machined is subjected to abrasion.

Fig. 2a illustrates how the device according to the invention is mounted in a first 20 alternative so that the truck 8 can be moved towards and away from a surface to be abraded. This design is utilised above all in narrow spaces. If there is sufficient space to move the truck 8 parallel to the surface during the abrasion, the design in 2b is preferred.

25 It can be seen that the device according to the invention, using a turntable by means of which the abrading head can be angled upwards, can also be used for abrading a roof surface.

## CLAIMS

1. Device for abrading a wall of stone or concrete material, which comprises:  
5 a shell (2) with which is operationally connected an abrading head (1), and a carriage (8) intended for moving at least along the surface and supporting the shell (2) moveably so that the abrading head (1) by the movement of the shell (2) performs an upward and downward abrading movement, characterised in that the abrading head (1) is of the type which has a rotatably mounted and driven planet wheel with a number of driven abrading discs rotatably mounted thereon and fitted with abrading elements, and an element for placing the abrading head (1) with a predetermined force against the surface to be abraded.
  
2. Device according to claim 1, characterised in that said element for placing the abrading head (1) comprises at least one gas spring (6) or at least one hydraulic cylinder/piston device.
  
3. Device according to claim 1 or 2, characterised in that the operational connection comprises a universal mounting (4) of the abrading head (1) with a counterweight (5) balancing this.
  
4. Device according to any of the previous claims, characterised in that the carriage is a forklift truck (8) and the shell (2) is intended to be mounted on the forks (8a) of the truck (8).

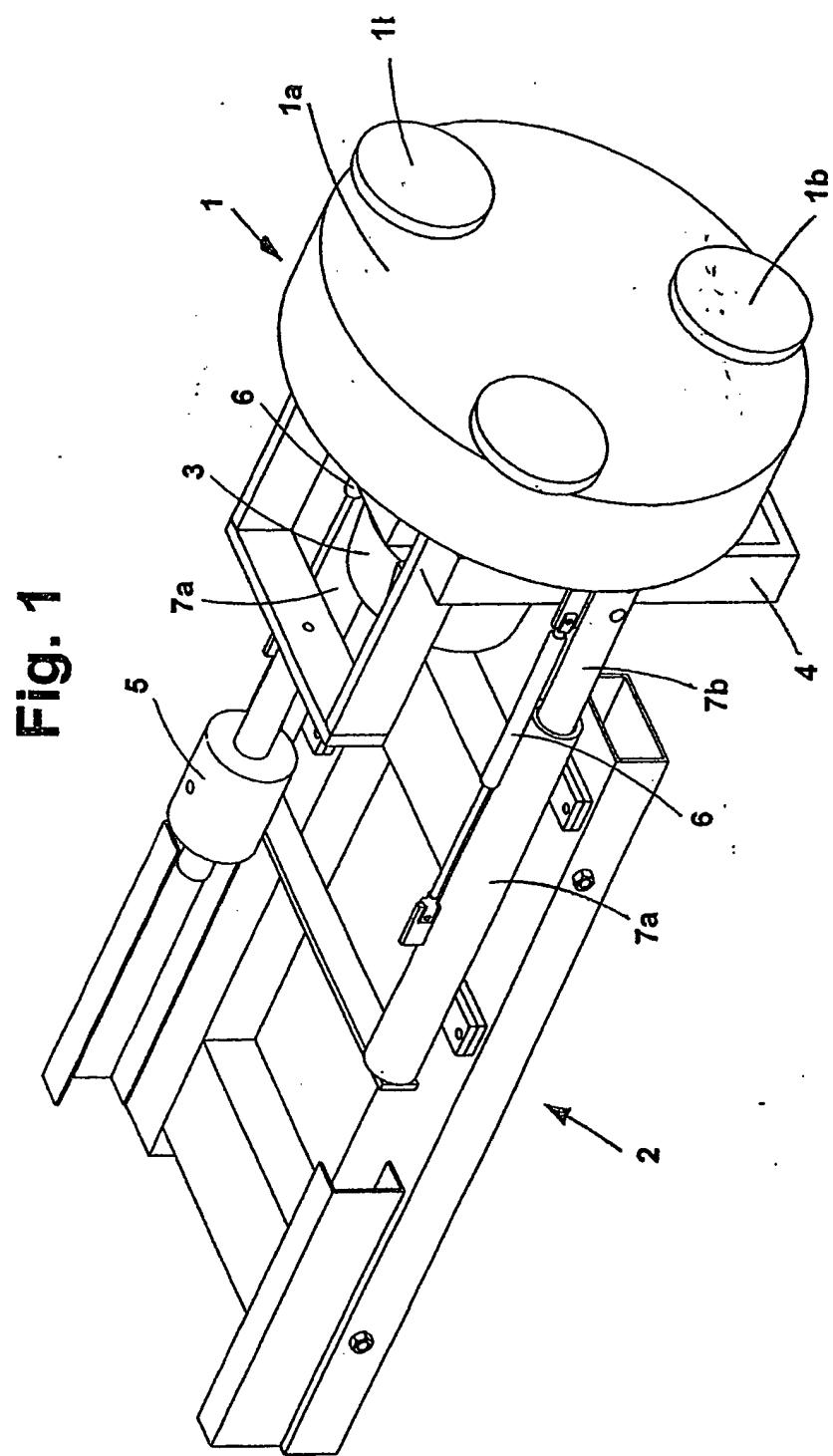


Fig. 1

Fig. 2a

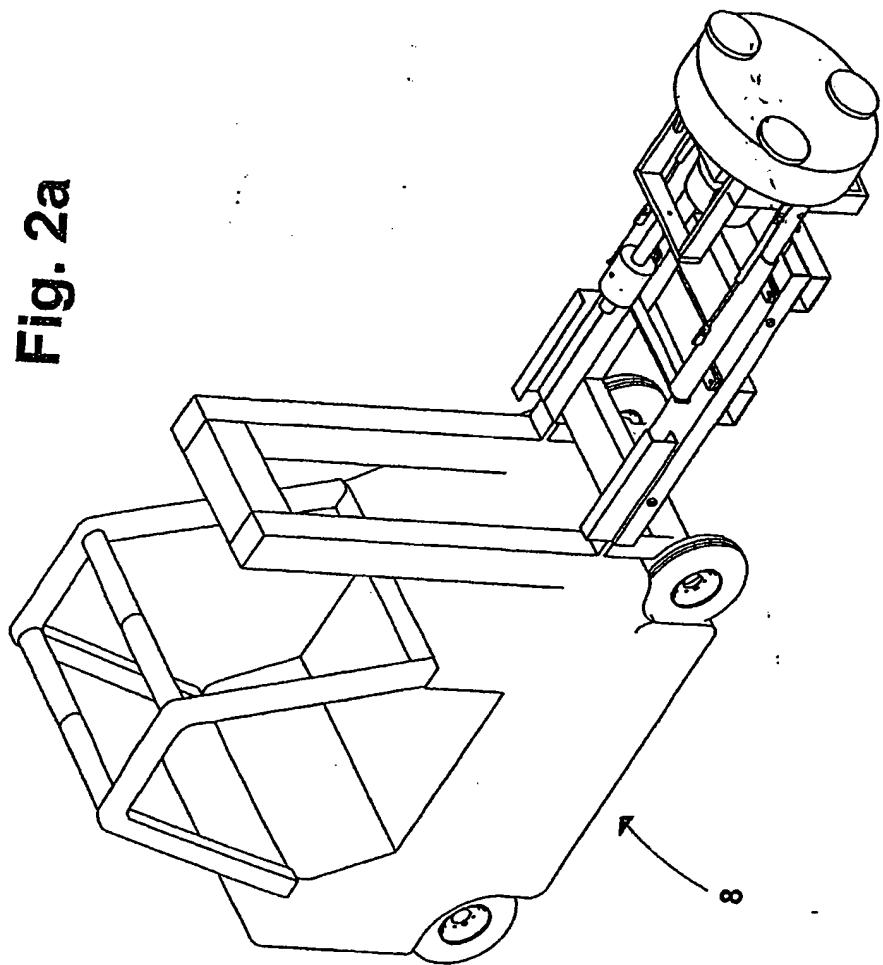
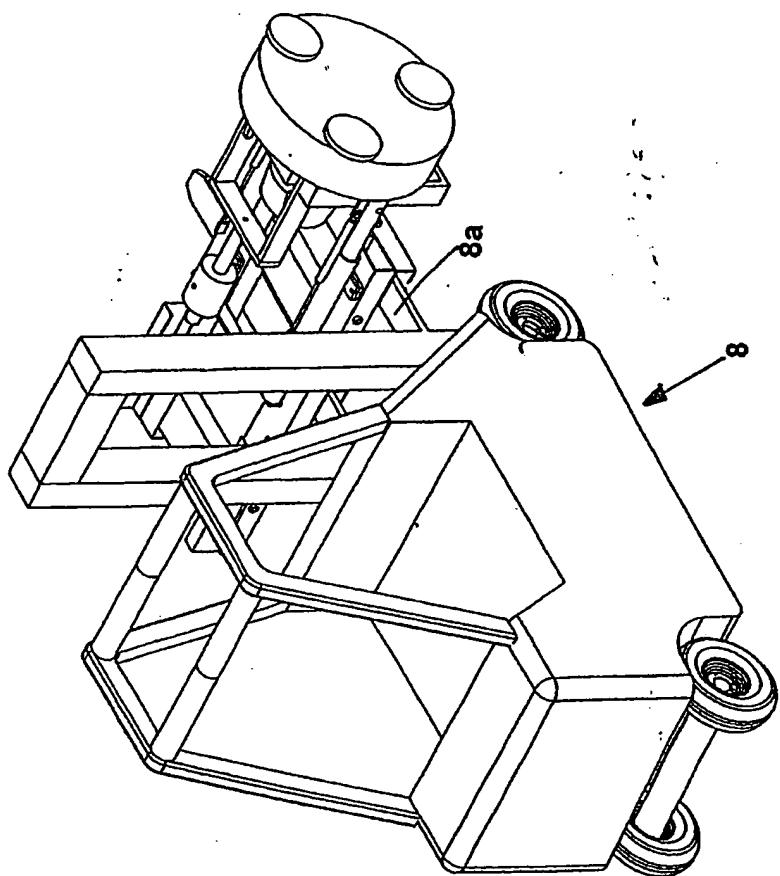


Fig 2b



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 2004/000904

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B24B 7/18

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A47L, B23Q, B24B, B25H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## EPO-INTERNAL, WPI DATA

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1407192 A (WAGGONFABRIK UERDINGEN A.G.), 24 Sept 1975 (24.09.1975), page 2, line 74 - line 76; page 2, line 98 - line 103; page 3, line 4 - line 16, figures 1,7,8 --	1
A	US 2787096 A (H.H. RIDDELS ET AL), 2 April 1957 (02.04.1957), column 1, line 15 - line 39; column 3, line 27 - column 4, line 52, figures 1, 4-8 --	1,2
A	GB 1038924 A (LE MATERIEL DE VOIRIE), 10 August 1966 (10.08.1966), figure 1, claim 1 --	1-4

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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## INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	US 1176262 A (P.ZOBOLI & G. VICENTINI), 21 March 1916 (21.03.1916), page 1, line 108 - page 2, line 5, figure 3, claim 1 --	1,2
A	US 1523049 A (J.A. CAMPBELL), 13 January 1925 (13.01.1925), figure 1 --	3
A	US 3748680 A (KENNETH EARL GRIFFIN), 31 July 1973 (31.07.1973), figures 1-4 --	1-4
A	US 4163302 A (VINCENT IABONI), 7 August 1979 (07.08.1979), figure 1, abstract --	1-4
A	US 4545156 A (WAYNE B. HOCKETT), 8 October 1985 (08.10.1985), figure 11 --	3
A	US 5280662 A (DENNIS K. VAN FOSSEN), 25 January 1994 (25.01.1994), figures 2, 10A-10D, abstract --	1-4
A	WO 02062524 A1 (THYSELL, HAKAN ET AL), 15 August 2002 (15.08.2002), figure 1, abstract, cited in the application -- -----	1

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

03/09/2004

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